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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2011 Survey Report

Brandy Branch Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Brandy Branch Reservoir were surveyed in 2011 using electrofishing and in 2012 using gill netting. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Brandy Branch Reservoir is a 1,257-acre impoundment of Brandy Branch Creek in the Sabine River Basin in Harrison County. It is used for power plant cooling and recreation. Structural habitat is mainly inundated timber. Native submersed aquatic vegetation and hydrilla were the most dominant plant types during the 2011 survey. Eurasian watermilfoil was discovered in 2007. Giant salvinia was introduced from a boat trailer in 2008 and immediate efforts to eradicate this invasive species were successful, as it has not been detected since the initial introduction.

- **Management history:** Largemouth bass are the primary sport fish in this reservoir. All sport fish have historically been managed with statewide harvest regulations.

- **Fish community:**
  - **Prey species:** Threadfin shad and gizzard shad were collected during the 2011 fall electrofishing survey. Gizzard shad abundance was low, but threadfin shad were present. Bluegill was the most abundant prey species collected during the 2011 survey. There was adequate prey available to largemouth bass in recent surveys.

  - **Catfishes:** Only three large channel catfish were collected during 2012 gill netting. Previous efforts to establish a reproducing channel catfish population have not been successful.

  - **Largemouth bass:** The largemouth bass population exhibited high relative abundance, good size structure, and adequate recruitment. The number of fish >14 inches has increased in recent population surveys. Relative weights were good for most inch groups indicating adequate prey availability. Largemouth bass had fast growth rates; the average age of 14-inch fish was 1.7 years. Of 30 fish submitted for genetic testing in 2011, 87% were pure Florida largemouth bass.

- **Management strategies:** Conduct electrofishing surveys in 2013 and 2015, and a gill netting survey in 2016. Invasive vegetation surveys will be conducted annually. Technical guidance will be given to controlling authority regarding vegetation management. All sport fish will continue to be managed under statewide harvest regulations.

INTRODUCTION

This document is a summary of fisheries data collected from Brandy Branch Reservoir from June 2011 through May 2012. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2011-2012 data for comparison.

Reservoir Description

Brandy Branch Reservoir is a 1,257-acre impoundment constructed in 1983 on Brandy Branch Creek in the Sabine River Basin. It is located in Harrison County near the City of Hallsville. The controlling authority is American Electric Power Company. Primary water uses are power plant cooling and public recreation. It has a watershed of approximately 4.1 square miles, a shoreline length of 17 miles, and a Shoreline Development Index of 4.1. Annual water level fluctuation was 2 to 4 feet (Figure 1). Supplemental water is pumped in from Big Cypress River (Lake O' the Pines) by the controlling authority to maintain sufficient water level for power plant cooling. Structural habitat consisted primarily of inundated timber and hydrilla was the most abundant aquatic plant. Boat access consisted of one public boat ramp. Bank fishing access was limited. Other descriptive characteristics for Brandy Branch Reservoir are in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Bister and Brice 2008) included:

1. Conduct annual invasive aquatic vegetation surveys and provide technical guidance to the controlling authority regarding aquatic plant management.
   Action: Surveys have been conducted annually. Giant salvinia infestation was prevented following immediate response and physical removal of plants introduced from a boat trailer. Mechanical removal of Eurasian watermilfoil and hydrilla was conducted by the controlling authority to maintain open water around an intake pump. The controlling authority has mentioned issues with aquatic plant fragments (mainly hydrilla) that need to be cleaned off their intake structure screens. However, lake-wide treatment of aquatic plants has not been advised because of the loss of fish habitat, the potential for a greater amount of plant material clogging screens following treatment, and the fact that aquatic plants will not be eradicated, resulting in continued management. It was recommended that methods to clean screens should be continued or improved to manage the situation.
2. Continue to participate with the controlling authority's fish attractor projects. Encourage the placement of a sign at the boat ramp showing locations of fish attractors or marker buoys at each fish attractor.
   Action: All fish attractor locations in the reservoir were refreshed with recycled Christmas trees donated by the City of Longview in 2008. Signs and marker buoys have not been installed at the reservoir, but locations of the fish attractors have been made available to anglers on the TPWD website: (http://www.tpwd.state.tx.us/fishboat/fish/recreational/lakes/fish_attractors.phtml).
3. Provide information to inform anglers of fishing opportunities.
   Action: News releases were issued to inform anglers of artificial fish attractor locations within the reservoir.

Harvest regulation history: Sport fishes in Brandy Branch Reservoir are currently managed with statewide regulations (Table 2).

Stocking history: Brandy Branch Reservoir was stocked initially with Florida largemouth bass, channel catfish, coppernose bluegill, redear sunfish, and green sunfish in 1983. Gizzard shad and threadfin shad were stocked to supplement the prey base. The complete stocking history is presented in Table 3.

Vegetation/habitat history: The dominant structural habitat in the reservoir was standing timber. Hydrilla has been the most dominant submersed vegetation species in this reservoir over the last 10 years. Coverage has been as high as 40% of the reservoir's surface in the 1990s (Ryan and Brice 1997, 2000). Native species coverage has been low to moderate, but submersed native vegetation has increased in recent years. Eurasian watermilfoil was detected in 2007. Giant salvinia and waterhyacinth were introduced to the reservoir in February 2008 by an angler who had not cleaned his boat trailer prior to launching. Immediate response by TPWD Inland Fisheries District staff resulted in the physical removal of all plants that could be found. No subsequent infestation was detected.

Water Transfer: Brandy Branch Reservoir receives water from Lake O' the Pines to maintain sufficient water level in the reservoir for power plant operation. This constitutes water transfer from the Cypress Creek basin to the Sabine River basin.

METHODS

Fishes were collected by electrofishing (1.0 hour at 12, 5-min stations) and gill netting (5 net nights at 5 stations). Trap netting was not conducted due to historically low crappie catch. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill nets, as the number of fish caught per net night (fish/nn). All survey sites (Appendix B) were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures Manual (TPWD, Inland Fisheries Division, unpublished manual revised 2011). An aquatic vegetation and structural habitat survey was conducted in August 2011.

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), as defined by Guy et al. (2007)], and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for gizzard shad (DiCenzo et al. 1996). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics and SE was calculated for structural indices and IOV. Ages were determined using otoliths from 13 largemouth bass (range 13.2 to 15.4 inches). Largemouth bass population genetics were assessed with micro-satellite DNA analysis using fish of various ages. Source for water level data was American Electric Power Company.

RESULTS AND DISCUSSION

Habitat: Structural habitat consisted primarily of standing timber (240 acres). Christmas tree fish attractor reefs have been constructed in the reservoir to help concentrate fish and increase angling success. There are currently seven attractors located in the reservoir (Appendix C). During the 2011 survey, approximately 15% (192 acres) of the lake surface area was comprised of native submersed vegetation and 21% (268 acres) was hydrilla (Table 4). The reservoir water level at the time of the vegetation survey was 4-feet below conservation pool elevation. Therefore, most emergent species were not inundated. Eurasian watermilfoil has been slow to expand since 2007 and only covered 14 acres at the time of the 2011 survey.

Prey species: Gizzard shad, threadfin shad, and several sunfish species were present indicating good prey fish diversity. The electrofishing catch rate of gizzard shad has steadily declined over the last ten

years. Only one gizzard shad was collected during the fall 2011 survey (Figure 2). However, the catch rate of threadfin shad was 136.0/h in 2011 (Appendix A). The electrofishing catch rate of bluegill was high in 2011 (1,196/h), which was similar to the previous two surveys (Figure 3). Redear sunfish were also present and provided additional opportunities for anglers as well as a component of the prey population for largemouth bass (Figure 4).

Channel catfish: Attempts have been made in previous years to establish a reproducing channel catfish population in this reservoir through the stocking of advanced-size fingerlings. These attempts have not been successful. Only three channel catfish were collected (range = 13 to 24 inches) during 2012 gill netting. Similarly, only three channel catfish (range 23 to 27 inches) were collected during 2008 gill netting.

Black bass: The electrofishing catch rate of largemouth bass in 2011 was 121.0/h, which was less than 2009 (142.0/h), but higher than 2007 (62.0/h) (Figure 5). The abundance of largemouth bass >14 inches has increased since 2007 as indexed by CPUE-14 of 13.0/h in 2007, 17.0/h in 2009, and 37.0/h in 2011 (Figure 5). Genetic analysis in 2011 indicated that the population was predominantly Florida largemouth bass; 87% of fish in the sample were pure Florida largemouth bass (Table 5). Growth of largemouth bass was fast. Average age at 14 inches (13.2 to 15.4 inches) was 1.7 years (N = 13; range = 1 – 2 years). Condition of largemouth bass was good with mean W_r for most inch groups >90, which indicated adequate prey availability.

Fisheries management plan for Brandy Branch Reservoir, Texas

Prepared – July 2012

ISSUE 1: Hydrilla was first documented in this reservoir in 1990, but has not caused access problems for anglers. The controlling authority occasionally reports issues with keeping intake screens clean of hydrilla fragments. Eurasian water milfoil was detected in 2007, but has remained at relatively low coverage. Giant salvinia was introduced during February 2008 by a boater, but has not been documented since eradication efforts.

MANAGEMENT STRATEGIES

1. Provide technical guidance to American Electric Power Company regarding invasive aquatic plant management.
2. Conduct annual surveys to monitor trends and estimate coverage of invasive aquatic plants.

ISSUE 2: American Electric Power, City of Longview, and Texas Parks and Wildlife have partnered in the past to place Christmas trees in the reservoir as fish attractors (Appendix C). These projects have been popular and well-received by the angling public.

MANAGEMENT STRATEGIES

1. Continue to participate in fish attractor placement projects with greater emphasis on securing donated trees.
2. Investigate additional opportunities to work with American Electric Power on fisheries improvement projects in the reservoir.

ISSUE 3: Anglers and stakeholders should be informed about fisheries management activities, fishing opportunities, and other issues at Brandy Branch Reservoir.

MANAGEMENT STRATEGIES

1. Continue to provide news releases to the print and broadcast media.
2. Continue to provide fisheries presentations to public regarding issues/opportunities.

ISSUE 4: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches and plugging engine cooling systems. Giant salvinia and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing and swimming. The financial costs of controlling or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters and literature so that they can educate their customers.
3. Educate the public about invasive species through the use of media and the internet.
4. Discuss invasive species when presenting to constituent and user groups.
5. Document existing and future inter-basin water transfers to facilitate potential invasive species responses.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes annual invasive aquatic vegetation surveys, a supplemental electrofishing survey in 2013, and required angler access, electrofishing, and gill netting surveys in 2015/2016 (Table 6). Annual invasive vegetation surveys are necessary to monitor plant coverage and expansion and to provide management suggestions to the controlling authority. Supplemental electrofishing in 2013 will be conducted to monitor the largemouth bass and prey fish populations. Trap netting will not be conducted because of the lack of crappie in the reservoir.

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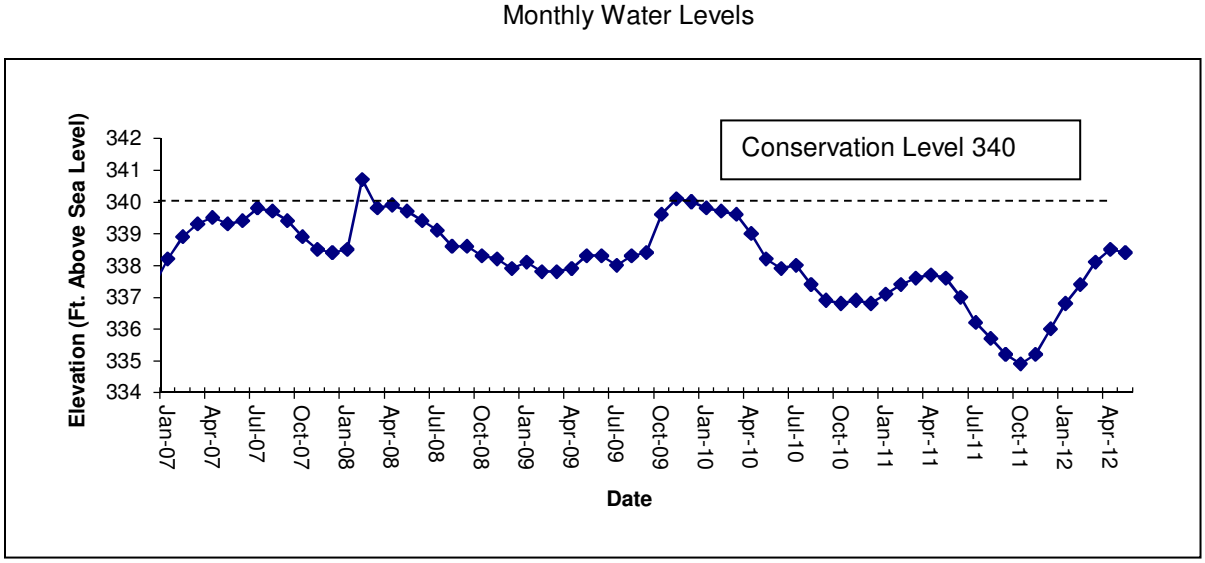


Figure 1. Monthly water level elevations in feet above mean sea level (msl) recorded for Brandy Branch Reservoir, Texas. Horizontal line denotes conservation pool level (340 msl).

Table 1. Characteristics of Brandy Branch Reservoir, Texas.

Characteristic	Description
Year constructed	1983
Controlling authority	American Electric Power Company (AEP)
County	Harrison
Reservoir type	Tributary/Cooling
Shoreline development index (SDI)	4.1
Conductivity	364 umhos/cm

Table 2. Harvest regulations for Brandy Branch Reservoir, Texas.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish, channel	25	12 - No Limit
Catfish, flathead	5	18 - No Limit
Bass, largemouth	5	14 – No Limit
Crappie, white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

Table 3. Stocking history of Brandy Branch Reservoir, Texas. Size categories are: FRY=<1 inch, FGL = 1-3 inches, AFGL = advanced fingerlings, ADL = adult, and UNK = unknown.

Species	Year	Number	Size
Black crappie	1990	78,648	UNK
	Total	78,648	
Bluegill	1993	416,780	FGL
	1993	9,984	FRY
	Total	426,764	
Channel catfish	1983	81,831	AFGL
	1984	60,252	FGL
	1986	51,573	AFGL
	1986	10,435	FGL
	2004	10,624	AFGL
	2004	64,412	FGL
	Total	279,127	
Coppernose bluegill	1983	123,000	UNK
	1985	88,014	FRY
	Total	211,014	
Flathead catfish	1983	16	UNK
	Total	16	
Florida largemouth bass	1983	120,952	FRY
	1984	242,000	FGL
	Total	362,952	
Gizzard shad	1991	1,260	UNK
	1992	1,000	UNK
	Total	2,260	
Green sunfish	1983	67,200	UNK
	Total	67,200	
Redear sunfish	1983	129,450	UNK
	Total	129,450	
Threadfin shad	1986	1,500	AFGL
	1991	1,490	ADL
	1992	1,000	ADL
	Total	3,990	
White crappie	1986	170	ADL
	1987	15,072	FRY
	Total	15,242	

Table 4. Survey of littoral zone and physical habitat types, Brandy Branch Reservoir, Texas, 2011. A linear shoreline distance (miles) was recorded for each habitat type found. Surface area (acres) and percent of reservoir surface area was determined for each type of aquatic vegetation found. The reservoir water level at the time of the vegetation survey was 4-feet below conservation pool elevation.

Shoreline habitat type	Shoreline Distance		Surface Area	
	Miles	Percent of total	Acres	Percent of reservoir surface area
Natural shoreline	17.2	97		
Concrete	0.5	3		
Standing Timber			240	19
Native submerged vegetation			192	15
Native emergent vegetation			0.04	Trace
Native floating-leaved			1	Trace
Non-native				
Hydrilla			268	21
Eurasian watermilfoil			14	1

Gizzard Shad

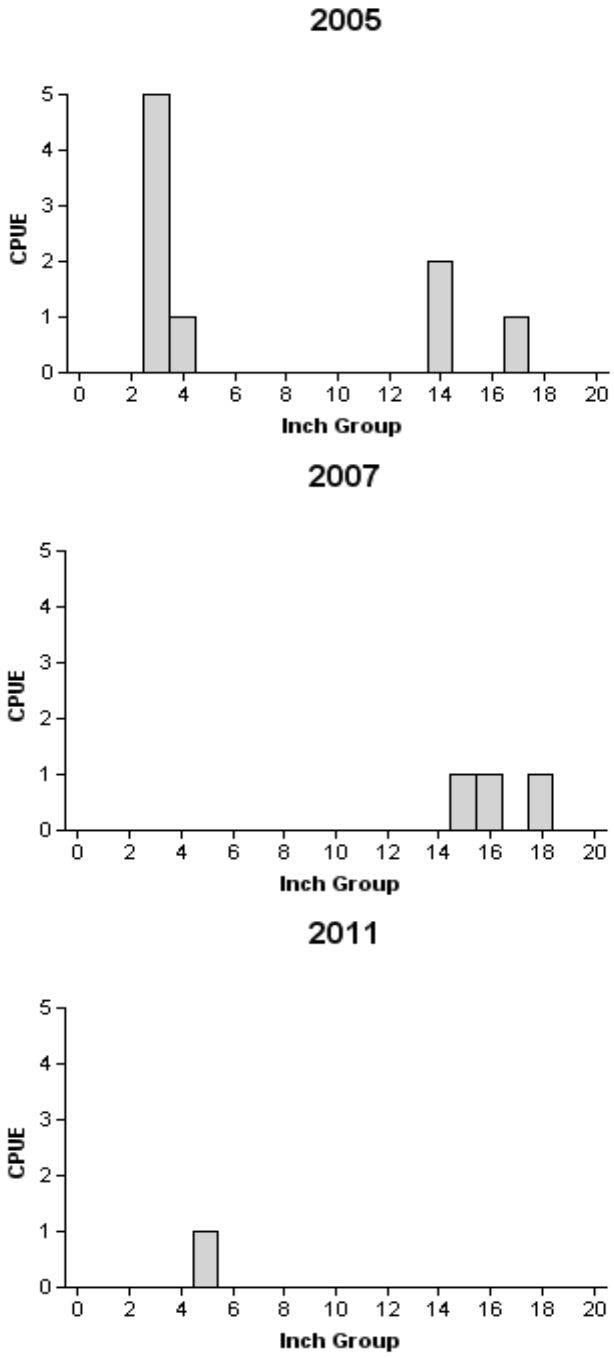
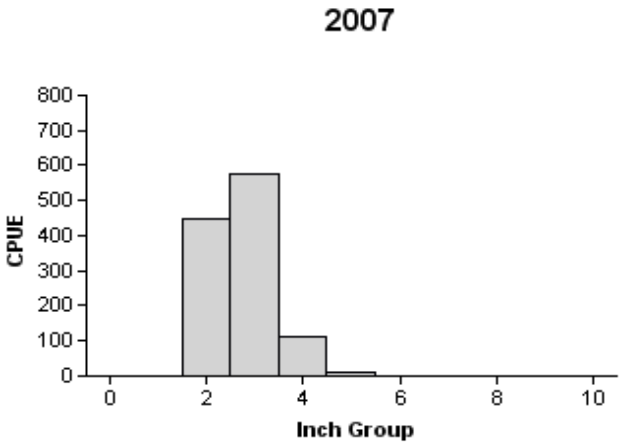
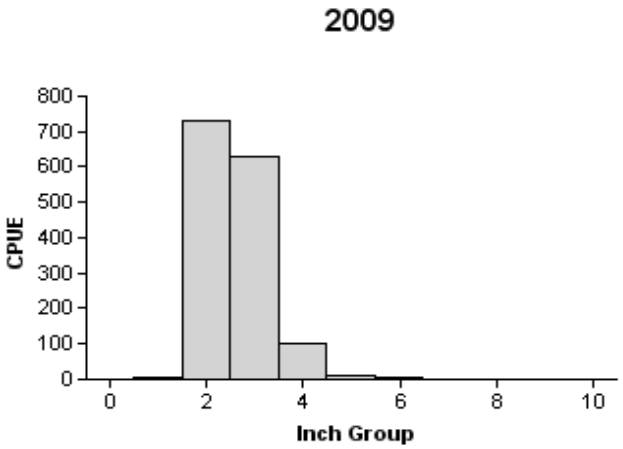


Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Brandy Branch Reservoir, Texas, 2005, 2007, and 2011. No gizzard shad were collected during the 2009 survey.

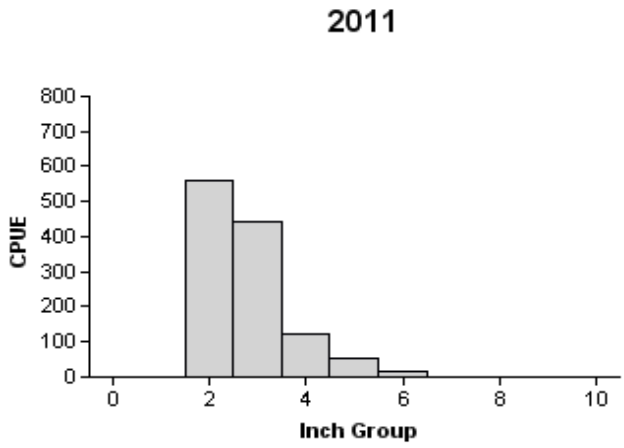
Bluegill



Effort =	1.0
Total CPUE =	1,154.0 (31; 1154)
Stock CPUE =	704.0 (31; 704)
PSD =	0 (0.3)
PSD-P =	0 (0)



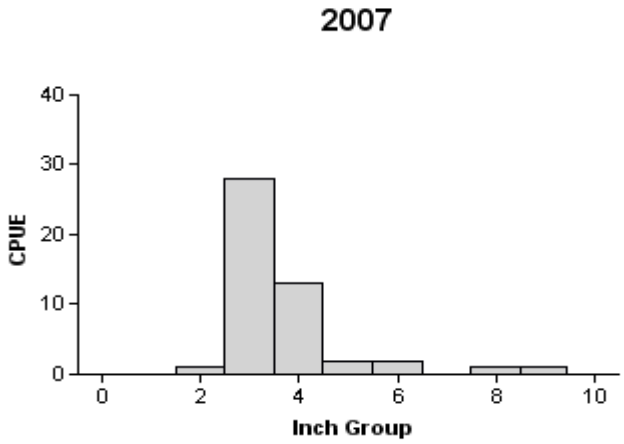
Effort =	1.0
Total CPUE =	1,477.0 (16; 1477)
Stock CPUE =	744.0 (18; 744)
PSD =	0 (0.2)
PSD-P =	0 (0)



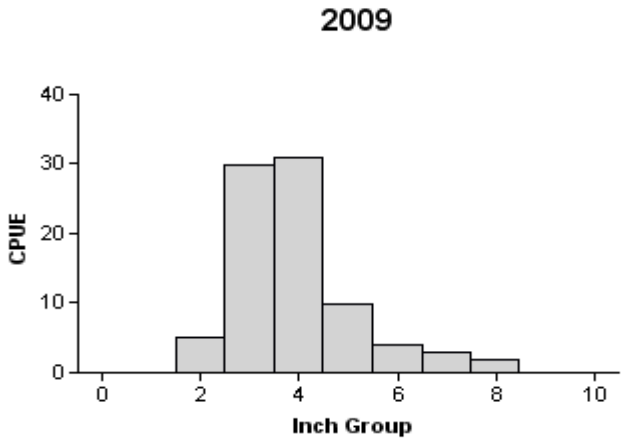
Effort =	1.0
Total CPUE =	1,196.0 (25; 1196)
Stock CPUE =	638.0 (23; 638)
PSD =	3 (0.7)
PSD-P =	0 (0.2)

Figure 3. Number of bluegill caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Brandy Branch Reservoir, Texas, 2007, 2009, and 2011.

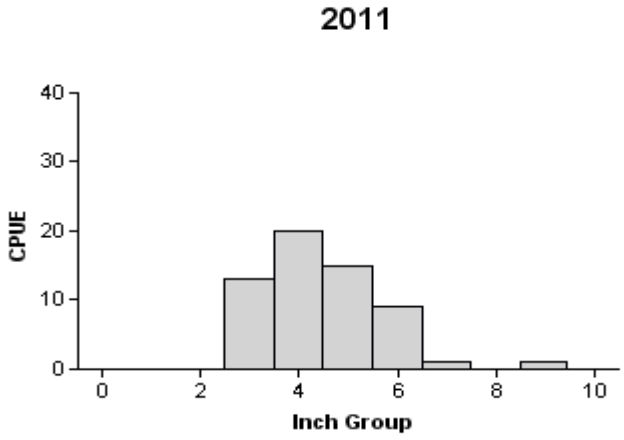
Redear Sunfish



Effort = 1.0
Total CPUE = 48.0 (32; 48)
Stock CPUE = 19.0 (41; 19)
PSD = 11 (7.2)
PSD-P = 5 (4.6)



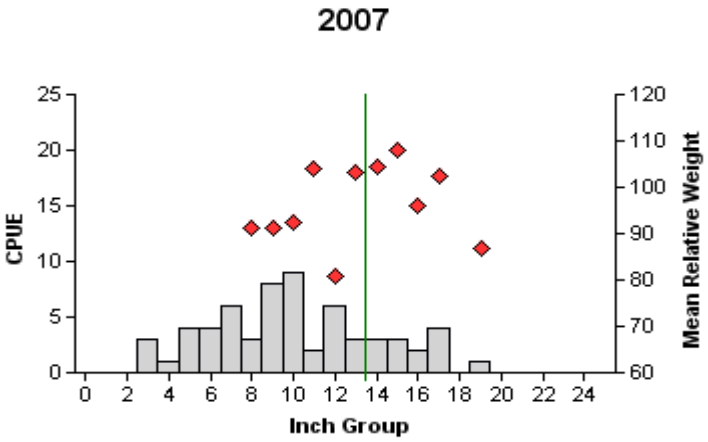
Effort = 1.0
Total CPUE = 85.0 (26; 85)
Stock CPUE = 50.0 (32; 50)
PSD = 10 (6)
PSD-P = 0 (0)



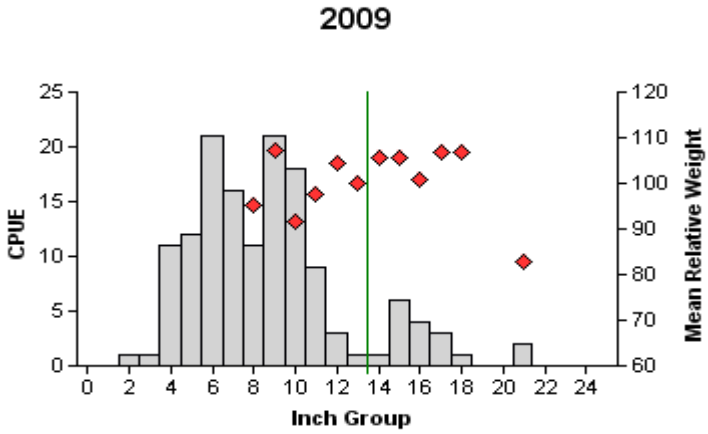
Effort = 1.0
Total CPUE = 59.0 (35; 59)
Stock CPUE = 46.0 (32; 46)
PSD = 4 (3.3)
PSD-P = 2 (2.4)

Figure 4. Number of redear sunfish caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Brandy Branch Reservoir, Texas, 2007, 2009, and 2011.

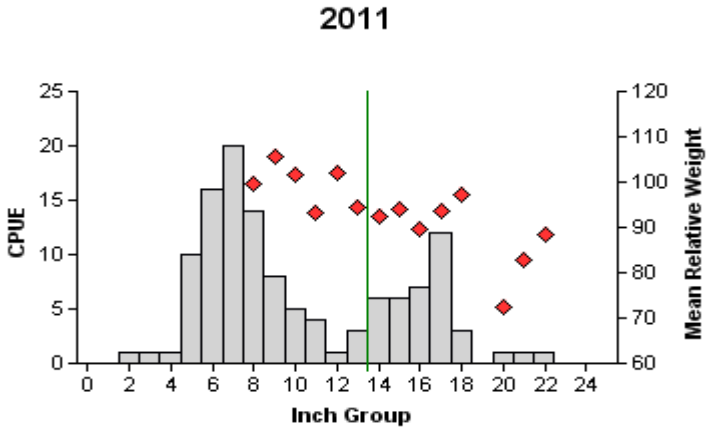
Largemouth Bass



Effort =	1.0
Total CPUE =	62.0 (22; 62)
Stock CPUE =	44.0 (23; 44)
CPUE-14 =	13.0 (31; 13)
PSD-14 =	30 (6.9)



Effort =	1.0
Total CPUE =	142.0 (11; 142)
Stock CPUE =	80.0 (10; 80)
CPUE-14 =	17.0 (25; 17)
PSD-14 =	21 (4.8)



Effort =	1.0
Total CPUE =	121.0 (11; 121)
Stock CPUE =	72.0 (11; 72)
CPUE-14 =	37.0 (18; 37)
PSD-14 =	51 (6.2)

Figure 5. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Brandy Branch Reservoir, Texas, 2007, 2009, and 2011. Vertical lines indicate minimum length limit.

Table 5. Results of genetic analysis of largemouth bass collected by fall electrofishing, Brandy Branch Reservoir, Texas, 2003, 2005, 2007, and 2011. Genetics were assessed with electrophoresis in 2003 and micro-satellite DNA analysis in 2005, 2007, and 2011. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, F1 = first generation hybrid between a FLMB and a NLMB, Fx = second or higher generation hybrid between a FLMB and a NLMB.

		Genotype					
Year	Sample size	FLMB	F1	Fx	NLMB	% FLMB alleles	% pure FLMB
2003	33	33	0	0	0	100.0	100.0
2005	30	30	[a]	[a]	0	99.5	100.0
2007	30	30	[a]	[a]	0	99.6	100.0
2011	30	26	0	4	0	99.0	87.0

[a] Determination of hybrid status not conducted.

Table 6. Proposed sampling schedule for Brandy Branch Reservoir, Texas. Gill netting surveys are conducted in the spring, vegetation surveys are conducted in the summer, and electrofishing surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

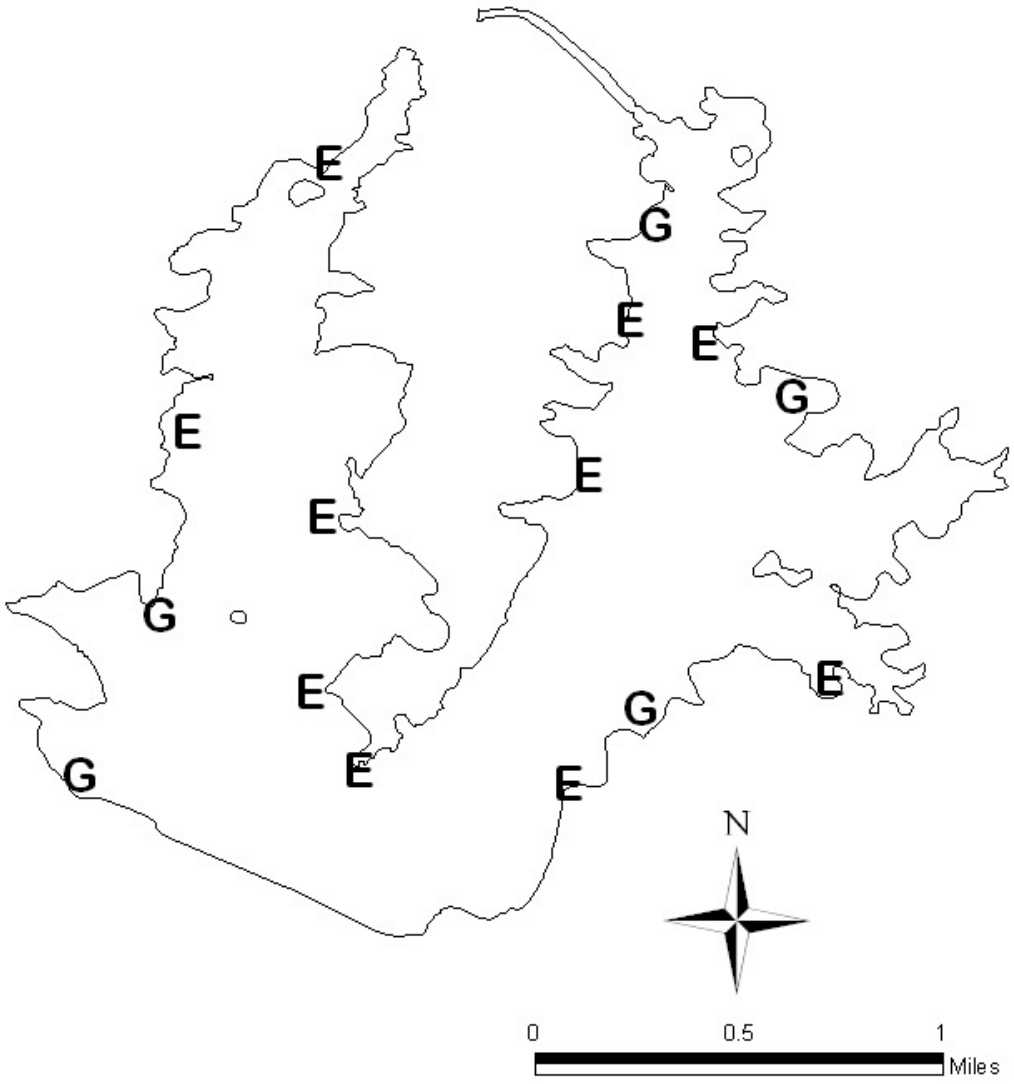
Survey Year	Vegetation	Electrofisher	Gill Net	Access	Report
2012 - 2013	A				
2013 - 2014	A	A			
2014 - 2015	A				
2015 - 2016	S	S	S	S	S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Brandy Branch Reservoir, Texas, 2011-2012. Trap netting was not conducted during this survey period.

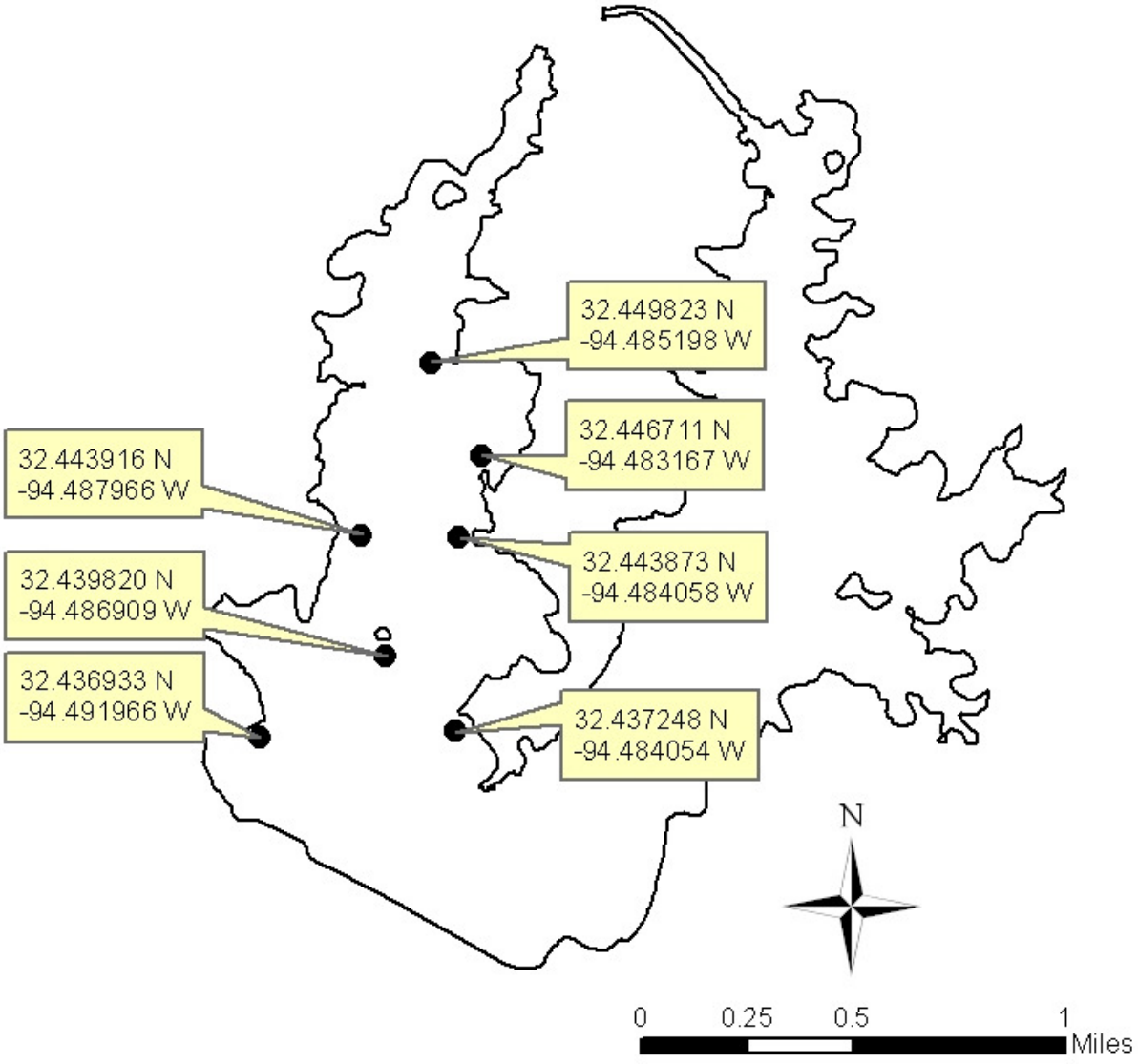
Species	Gill Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard shad			1	1.0
Threadfin shad			136	136.0
Warmouth			1	1.0
Bluegill			1,196	1,196.0
Redear sunfish			59	59.0
Channel catfish	3	0.6		
Largemouth bass			121	121.0

APPENDIX B



Location of sampling sites, Brandy Branch Reservoir, Texas, 2011-2012. Gill net and electrofishing stations are indicated by G and E, respectively.

APPENDIX C



Locations of fish attractors, Brandy Branch Reservoir, Texas. Each site was replenished with fresh trees in 2008.